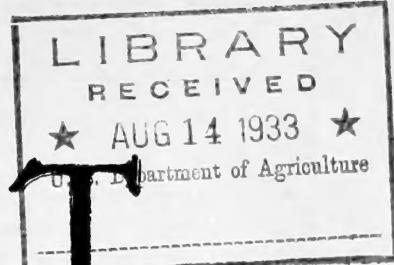


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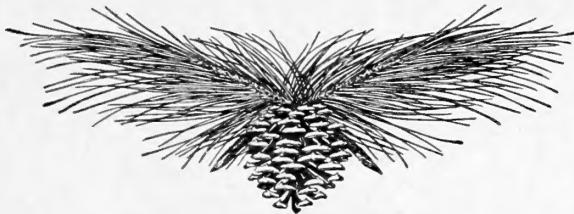
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FOREST WORKER



July 1933

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Announcements

American Forestry Association Plans Notable Meeting

With seven other conservation organizations participating, the American Forestry Association will hold its 1933 annual meeting in New Hampshire September 5-8. Members of the Society for the Protection of New Hampshire Forests, the Appalachian Mountain Club, the Massachusetts and Connecticut Forestry Associations, the Empire State Forest Products Association, and the New England and New York sections of the Society of American Foresters will gather with members of the association at Franconia, N.H., on September 5 for the opening event, a dinner at the Forest Hills Hotel, headquarters for the meeting. Following the dinner, addresses of welcome will be given by W. R. Brown, chairman of the New Hampshire Forestry Commission, and James E. Scott, supervisor of the White Mountain National Forest; and brief greetings will be delivered by representatives of various New England organizations. George D. Pratt, president of the American Forestry Association, will act as chairman on this occasion.

On September 6, a field trip is scheduled through the Crawford Notch State Forest, the Bartlett Experimental Forest (used as a field laboratory by the Northeastern Forest Experiment Station), and other points of interest. Secretary of Agriculture Henry A. Wallace and Dean Henry S. Graves of the Yale School of Forestry will address an evening session.

Another inspection tour, on September 7, will include visits to the Gale River Experimental Forest, where

members of the Northeastern Forest Experiment Station staff will explain some of the studies under way; to a national forest timber sale area; a wild-life restoration project; the Lost River reservation of the Society for the Protection of New Hampshire Forests; and to Franconia Notch and the Flume. A stop for luncheon will be made at the Wildwood Emergency Conservation Camp, where Robert Fechner, director of emergency conservation work, R. Y. Stuart, United States Forester, and Senator David I. Walsh, of Massachusetts, will speak briefly. An open discussion on the topic "Recreational Uses of the White Mountain Forest" will be held that evening at the hotel.

The last trip of the meeting, on September 8, will be to another emergency conservation camp and to a 650-acre timber sale area where spruce and hardwoods were cut in 1925-27. The meeting will disband after a scenic drive and a luncheon at Mount Washington Hotel at which Gov. John G. Winant of New Hampshire will act as toastmaster.



The council of the Save-the-Redwoods League will hold its annual meeting on the last Thursday of August, which this year will be August 31. The meeting will be held at 114 Sansome Street, San Francisco, Calif., in room 627.



The Central States Forestry Congress is scheduled to meet September 21-23, 1933, at the Hotel Sherman, Chicago, Ill.

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State Forestry

Work Has Begun in State Emergency Conservation Camps

Before he approved any of the emergency conservation camps proposed by the States for projects on State and privately owned lands, as authorized in the Unemployment Relief Act of March 31, 1933, the director of emergency conservation work sent the following telegram to the governors of all States on May 5, 1933, outlining the conditions under which such camps might be established:

Before approving emergency conservation work projects on State, county, and municipally owned land, the President desires assurance that you will urge the State legislature, if now in session, or if not, at its next succeeding session, to enact legislation providing that if as a result of the work done the State derives a direct profit from the sale of the land or its products the proceeds will be divided equally between the State and the Federal Government until the State shall have paid for the work done at the rate of \$1 per man per day for the time spent on projects subject to a maximum of \$3 per acre. President desires that no work shall be done on privately owned land except as may be necessary in the public interest for regional or State-wide forest protection against fire, insects, and disease and/or simple flood control measures to arrest gully erosion and flash run-off at headwaters of mountain streams. Where public interest demands work on privately owned land for these purposes the President requests that it be conditioned on State assuming responsibility for maintenance of works by landowners or otherwise and obtaining contracts with the landowners by which the State reserves the right to remove at its option and without recompense to landowners any structures or other things of removable values which may result from the work done, including products of trees planted to arrest erosion. Please wire at your earliest convenience whether you agree to this plan.

ROBERT FECHNER,
Director of Emergency Conservation Work.

The governors of all States involved agreed to these conditions, and 755 camps have been approved for work on State and private lands.

The camps are divided into four types—those on State forests, those on State parks, those on private land for forest work, and those on State or private land for erosion or flood-control work. The total number of camps in each of these categories is: In State forests,

309; in State parks, 101; on private forest land, 221; and for flood control, 124. The number of camps of all types in each State is as follows:

Alabama, 14	Nebraska, 5
Arkansas, 7	New Hampshire, 5
California, 27	New Jersey, 8
Colorado, 2	New York, 33
Connecticut, 12	North Carolina, 11
Florida, 15	North Dakota, 7
Georgia, 30	Ohio, 17
Idaho, 22	Oklahoma, 12
Illinois, 33	Oregon, 8
Indiana, 21	Pennsylvania, 89
Iowa, 16	Rhode Island, 3
Kansas, 7	South Carolina, 16
Kentucky, 13	South Dakota, 5
Louisiana, 20	Tennessee, 13
Maine, 12	Texas, 34
Maryland, 10	Utah, 5
Massachusetts, 27	Vermont, 10
Michigan, 45	Virginia, 26
Minnesota, 37	Washington, 15
Mississippi, 12	West Virginia, 8
Missouri, 15	Wisconsin, 26
Montana, 1	Wyoming, 1

These camps are under the supervision of the State forestry departments, the work in State parks being subject to the approval of the National Park Service of the Department of the Interior and that in the other camps to approval by the United States Forest Service. The Bureau of Agricultural Engineering is cooperating in the erosion control work by giving instructions in the building of dams.

A somewhat wider range of projects will be carried out on State forests than on private lands; for instance, tree planting, forest, timber, and range survey, and timber-stand improvement will be carried out on the former but not on the latter. The principal classes of work authorized for all projects are: Preventing and fighting forest fires; fire-hazard reduction (on private lands this does not include any slash disposal or other hazard removal required of the landowner under State law); telephone-line construction (for fire protection); erection of lookout towers and observatories; construction of protective structures, such as cabins and tool

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sheds; truck-trail construction; horse-and-man-trail construction; development of emergency fire-control landing fields; firebreak construction; control of insect epidemics; control of blister rust and other tree disease epidemics; erosion and flood control; and maintenance and reconstruction, as well as construction, of the authorized classes of improvements.

New Minnesota Law Adds to Number of State Forests

By an act of the 1933 Legislature, four new State forests were created in Minnesota and changes were made in the area and boundaries of many of those previously established. There are now 19 State forests in Minnesota, with a gross area of 3,737,000 acres, of which the State now owns 1,082,000 acres. According to the new law, these forests are to be administered "for the purpose of preserving, propagating, and breeding wild life of all suitable kinds, including all species of game, fish, and fur-bearing animals, and birds of rare and useful species, and especially for the development of forests and the prevention of forest fires * * * and for the protection of watershed areas, valuable for domestic and commercial uses, and for the establishment and development of recreational areas."

Other acts passed at the 1933 session provide for the exchange of lands acquired by the State under the tax delinquency laws for private land in consolidating State holdings; for the acquisition of the State by gift, purchase, or condemnation of tracts of land for firebreaks (amending a law authorizing such acquisition for lookout towers, buildings, and other uses); for the return of 50 percent of the gross receipts from any State forest to the county where such forest is located; and for the extension of the period of redemption of lands sold for taxes from 5 to 7 years.

Recent Land Purchases in New York

An area of 4,037 acres in St. Lawrence and Hamilton Counties has been purchased by the State of New York to be added to the Adirondack Forest Preserve. The land was the property of the Atherton Forestry Co. of New York City.

Unusual recreational values are found in this region. Big Trout and Little Trout Ponds and 2½ miles of the Bog River, an excellent fishing stream, are included in the tract, which is easily accessible to transportation facilities.

In line with the State conservation department's policy of securing as rapidly as they can be obtained at reasonable prices the lands upon which forest-fire observation stations are located, a ½-acre tract in the town of Moriah, Essex County, in the Adirondack section, has been acquired. The Belfry Mountain State fire-observation station is located on this area. A 12-foot right of way from the public highway to the station is included in the purchase.

Arkansas' First State Forester

On July 1, 1933, the first State forester of Arkansas entered upon his duties. The appointee is Charles A. Gillett, who since 1929 has been extension forester of Arkansas. Mr. Gillett is a graduate of the Cornell school of forestry, from which he received the degree of M.F. in 1929. He was extension forester of North Dakota from 1925 to 1928.

The act of the Arkansas Legislature providing for a State forestry commission and a technically trained State forester was passed in March 1931, but no funds were appropriated at that time. The present appointment is on the basis of \$8,000 raised by private subscription.

Alabama Passes an Enabling Act

An act of the Alabama Legislature authorizing the Federal Government to extend purchases of land for national-forest purposes to include lands in the Tennessee River Valley in Alabama was approved by the governor April 10, 1933. Prior to the enactment of this law the Federal Government was limited in acquisition of new lands in the State to areas within the present exterior boundaries of the existing Alabama National Forest.

Gypsy Moth Rediscovered in New Jersey

After 4 years during which no signs of the gypsy moth had been found in New Jersey and the State was considered to be free of any infestation of the insect, employees of the State Department of Agriculture recently discovered a gypsy moth egg mass near Mount Freedom, in Morris County. It is believed that the egg mass represents wind dispersion from an undiscovered colony, probably within several miles of the discovery. Scouting is being done to locate the parent infestation.



The European pine shoot moth continues to cause extensive and serious damage to Norway pines in New York. The insect has been distributed with infested nursery stock, and is now established in ornamental plantings in or near most of the larger cities of the State, as well as on many afforested areas, according to the United States Bureau of Entomology.



Dates of open seasons for almost all varieties of wild game in New York were changed by the State Legislature at its last session. In many cases the change increases the length of the season from the period October 25 to November 15 to the entire month October 15 to November 15.

New Jersey Relief Cooperation Helps Private Woodland Owners

In cooperation with local and county relief agencies, the forestry division of the New Jersey Department of Conservation and Development has developed a plan whereby privately owned timberlands and woodlands in the State are being made more productive by improvement cuttings without cost to the owners. Systematic thinnings are badly needed on many of these lands after years of careless cutting and abuse during which the owners have been unable or unwilling to make the necessary expenditure to have such work done.

Many relief agencies in the State have organized wood-cutting gangs to cut fuel wood for local distribution. The forestry division locates suitable woodlands the owners of which are glad to have the work done and are willing to donate the wood in return. The division's foresters mark the trees to be cut and supervise the work to insure satisfactory conduct of the operation.

This particular type of cooperative service was initiated last year with the city of Trenton and has recently been extended to Monmouth, Warren, and Somerset Counties.

Georgia's Newsprint Facilities Inspected by Paper Makers

Representatives of several organizations of technical paper manufacturers visited Savannah, Ga., on May 1 and 2 at the invitation of the Georgia Forestry Association, which was holding its annual meeting at that time. The 75 pulp and paper men joined in several sessions with the foresters and inspected pine forests in the vicinity of Savannah and the Georgia Pulp and Paper Laboratory, where Dr. Charles H. Herty has conducted his experiments in the use of southern pines for making newsprint.

Some of the paper manufacturers were disappointed in the pine stands because of the scarcity of young trees of the proper size for paper making. The prevalence of fire in Georgia forests has been the cause of great losses of young trees and has in many cases prevented natural reforestation. It is apparent, however, that the land is capable of growing plenty of pulp material if given a chance.

Indiana Nurseries Have a Busy Season

Indiana's three State forest nurseries were about sold out of salable trees during the spring planting season. A total of 1,987,555 trees was distributed and orders received for 373,800 more could not be filled. Of those distributed, 1,107,970 were conifers and 879,585 were hardwoods. Farmers received the largest number, or 806,520; coal operators received 582,000; 208,884 were planted on State forests, 389,151 on State parks, and 1,000 on State game preserves.

In the Clark County State forest nursery 450 seed beds of American red, Virginia, jack, and white pines, and of Norway spruce were prepared this spring. These beds should produce 2,500,000 trees. In addition, approximately 1,450 seed beds of hardwoods were prepared, which should produce 1,700,000 trees. About 1,500,000 trees of the coniferous species were transplanted at the same nursery.

At the Jackson County nursery approximately 1,500,000 trees were transplanted, the stock being obtained from the Clark County nursery. The same number of trees was transplanted in the Shakamak nursery at Jasonville, Ind., making the total number of trees transplanted in the State this spring 4,500,000.

Spring Planting in Pennsylvania

Charles R. Meek, chief of the bureau of forest extension of the Pennsylvania Department of Forests and Waters, reports that 1,926 shipments were made from the four State forest nurseries in Pennsylvania during the spring planting season of 1933. Approximately 6,750,000 seedlings and transplants were included in these shipments. The number of trees planted in the State in 1933 will probably total about half a million less than last spring.

State forest planting this year amounted to 1,450,000 trees, the largest number set out in any one year since 1919. More than 600,000 trees were planted on lands owned by the State but not in State forests. The largest individual planting was at the Pymatuning Reservoir in Crawford County where 326,500 trees were set out. The largest individual State forest planting project was carried on in the Moshannon State Forest in Centre and Clearfield Counties, where 645,000 trees were planted.

Proposed Minnesota Amendment Would Authorize Land Exchanges

An amendment to the State constitution of Minnesota was proposed at the last session of the legislature which would allow the State to exchange State lands "for lands of the United States and other privately owned lands as the legislature may provide". This amendment will come up for vote at the general election in 1934. It is nearly identical with one which was voted on and defeated at the 1932 general election, the addition of the words "and other privately owned lands" being the only change.



Of \$14,000 received by the division of lands and forests of the New York State Conservation Department for relief work, \$3,500 is to be spent in employing men to fight the gypsy moth invasion that continues to threaten the wooded areas of eastern New York.

Planting Scrub Oak Areas in Pennsylvania

Successful reforestation of scrub oak lands costs about twice as much as planting on open fields, but the resulting stands should be more nearly normal in rooting and development, writes George S. Perry in the Service Letter of the Pennsylvania Department of Forests and Waters. He describes experimental plantings of 11 species made on scrub oak areas on Kettle Springs Flat and Snowy Mountain in the Mont Alto State Forest, Franklin County, Pa., most of the trees having been planted in the spring of 1930.

The experiments showed that there is an optimum age or size for each species. Three-year-old stock of Scotch pine was the best. Surprisingly, Norway pine transplants were inferior to the less expensive seedlings. However, the unusually dry summer of 1930 may have affected the results.

The most promising method of planting was the gridiron system, with straight parallel lines brushed out across the planting area at intervals of 25 feet. Trees of rapid growth and strong light demands, such as Scotch pine, pitch pine, or larch, were set alternately along these rows, averaging about 25 per 100 feet of line, and located where digging was easiest, between the scrub oak stumps, and outside the crown spread of any desirable trees occurring naturally and retained in the rows. In the uncut strip of brush between the rows tolerant or semitolerant trees, such as white pine, Norway pine, and Norway spruce, were set. The trees planted in the open rows will need one or two careful assistance cuttings.

In planting scrub oak areas, large and well-rooted nursery stock should be used under all conditions. Trees planted with a mattock in the ordinary way showed up as well as those set with a dibble or spade, though possibly the growth of later years may show that the latter have better-developed root systems.

Chinese pine (*Pinus sinensis*) and sawara cedar (*Chamaecyparis pisifera*) were among the most successful trees used in this work. They both yield excellent wood, and the seeds of Chinese pine being edible and highly nutritious would add a valuable food for forest wild life. In Japan, where it is native, sawara cedar grows to a height of 100 feet and forms dense forests.



Twenty-three thousand trees were sold from the West Virginia State forest nursery at Lesage, Cabell County, this year, reports the State forester. Many of them were ordered by coal and lumber companies in various sections of the State. The trees furnished included red pine, Norway spruce, white spruce, and black walnut. It is planned to add to the supply of hardwoods for distribution next year black cherry, yellow poplar, and possibly sugar maple.

State Foresters to Meet in Indiana

Indiana has been selected by the board of directors of the Association of State Foresters as the State where the 1933 annual meeting of the association will be held, according to word received by R. F. Wilcox, Indiana State Forester, from William G. Howard, superintendent of forests and parks of New York and president of the association.

A 3-day itinerary will be prepared which will include visits to the State forests, parks, and game preserves of Indiana. The exact dates have not yet been announced, but the meeting will probably take place early in October.



The New York State Conservation Department, cooperating with the United States Geological Survey, has established two stream gauging stations, one in Chenango County and the other in Cortland County, for the purpose of determining the effect of reforestation upon the amount of stream flow. A considerable area in these two counties was planted by the State in 1932. During the early years of the growth of these forests, the streams may be regarded as flowing through unforested land, but as the trees grow the effect on stream flow should become discernable.



Three new 80-foot forest-fire observation towers have been ordered by George H. Wirt, chief forest fire warden of the Pennsylvania Department of Forests and Waters. One of these will be erected on Tussey Mountain, Huntingdon County, in the Logan State Forest District; another on Bald Mountain, Carbon County, in the Weiser State Forest District; and the third near McCord, Centre County, in the Moshannon State Forest District. A 60-foot tower now standing on Bald Knob, Huntingdon County, is to be moved to a site near Tyrone and increased to 80 feet in height.



A new pamphlet describing the 14 Wisconsin State parks has just been published and copies may be secured from the Wisconsin Conservation Department at Madison. Since the last Wisconsin park pamphlet was issued 4 of the then State parks have been designated as State forests, and one new park, Merrick, on the Mississippi River near Fountain City, has been created.



The forestry division of the Louisiana Department of Conservation has established an educational section, the function of which is to promote in the schools the realization of the necessity for forest-fire protection and the benefits of growing timber crops.

Montana Again Appoints Volunteer Wardens

The appointment in 1932 of 1,500 citizens of Montana as volunteer forest-fire wardens having been successful in helping to reduce the number of man-caused fires during the year, 2,000 such appointments are being made this summer. The notable decrease in this class of fires

in 1932 in comparison with the two preceding years is attributed by Rutledge Parker, State forester of Montana, largely to the efforts of the modern "vigilantes."

Each volunteer warden receives an appointment card which authorizes him to make arrests of persons found violating the State fire and forest laws, including careless campers and smokers as well as incendiaries. The appointees serve without pay.

Education and Extension

Development of Wood Crafts in West Virginia

In his annual report for 1932, T. W. Skuce, Extension Forester of West Virginia, tells of efforts to develop sources of income on West Virginia farms to supplement the diminishing returns from the usual crops. The West Virginia farm woodland has been an important source of cash, but at present there is practically no market there for local timber. To overcome this handicap and to aid in making the farm woods pay, the extension forester and the county agents have encouraged the development of such home industries as the making of furniture, baskets, chairs, handles, etc.

One man in Randolph County, using red cedar wood which had been cut out during a campaign against cedar rust of apples, made chests trimmed with curly ash that sold for \$25 to \$50 each. He sold 65 during the year, and his success has encouraged his neighbors to plan the production of other wooden articles, such as chairs, stands, and tables.

Another farmer of Randolph County developed such ability in the reproduction of antiques that he sold \$250 worth at the Mountain State Forest Festival at Elkins in 1932. In addition he received orders for more than \$1,525 worth of his products, including \$1,275 in one order. His raw material comes from his own farm woods.

In another county—Upshur—chestnut had been going into car-door boards, crossties, and mine timbers. The farmers of Adrian, French Creek, and Rock Cave were shown that more money could be made by using their wood for fencing material for estates. Following this advice, they shipped during the year 20 cars of jumping, garden, sheep, and stock fencing through cooperative effort.

Another use for chestnut was opened up in the making of camp buildings. These were so built that they could be moved by truck and be easily set up. With bunks, shelving, cupboards, table, and benches all provided, the prices of these ran from \$128 to \$640. They were displayed at the Mountain State Forest Festival and at a 4-H camp at Jackson's Mill with the result that

20 were sold and 27 prospects were listed for future contact.

The project of converting miners into woodworkers was undertaken in Monongalia County to aid in relief work. Under the direction of a farmer with experience in the work, 250 miners have learned to handle tools and turn out very good articles and furniture. Difficulties in obtaining tools were overcome by making them, nearby farmers supplying the wood needed and the metal being obtained around the mines. More than \$6,000 worth of business has been done by these miner-woodworkers, and the Mountaineer Craftsmen's Cooperative Association has been organized to facilitate marketing.

To stimulate the production and appreciation of home-grown forest products among the boys of the 4-H clubs, assistance was given in the development of a handicraft project. Some exceptionally fine work was exhibited last summer by a number of the boys, who had started shops at home for the production of attractive articles for sale to the public. In Berkeley County, through the 4-H clubs, the cash income of farmers was increased by the production of wooden toys, the cutting of split wood for rebottoming chairs, and the making of chairs themselves. The latter activity alone brought in more than \$500.

Practical Courses Offered at the Idaho Forest School

Courses in tractor operation and blasting were offered to students of logging engineering at the Idaho School of Forestry this year.

The tractor course was instituted in the spring of 1932 and was repeated in 1933 with added attention given to theory. A tractor company furnished the necessary equipment and the department of agricultural engineering of the University of Idaho cooperated in the instruction. During the winter a "tractor short course" was given to afford the forestry students an opportunity to obtain preliminary experience in actual operation of a tractor. The students accomplished some practical results in the course of their practice, and an effort is being made to obtain the necessary road- and trail-building machinery to

improve and make more accessible the school forest on Moscow Mountain through the work of the class.

In order to give Idaho forestry students first-hand information in the use of explosives in forest work, a series of lectures terminating with a practical field demonstration was conducted in April for logging engineering students. Demonstrations were given in blasting stumps for rights-of-way, blasting rocks for forest roads and trails, and removing standing trees and snags. This course, too, lends itself to practical ends, and it is planned hereafter to conduct the field work on the school forest where stumps, trees, and projecting rocks can be removed from road locations.

Timber Estimating Project for Virginia 4-H Clubs

Virginia 4-H forestry club members who have completed a forest improvement project are eligible to enter a timber estimating project. Boys undertaking this work will learn: (1) To figure the board-foot contents of lumber and other sawed products; (2) to determine the amount of lumber that can be cut from saw logs (scaling); (3) to estimate the board-foot contents of standing trees (estimating); and (4) to determine the amount of merchantable timber on a given area (cruising).

The average farm in Virginia, as elsewhere, has need for considerable quantities of lumber, and also has timberland from which the farmer may wish to sell material from time to time. This project will familiarize the farm boy with the unit of measure used in buying or selling lumber, logs, and standing trees, and will teach him how to use it.

Interest in Tree Planting Increases in West Virginia County

Farmers and 4-H clubs in Brooke County, W. Va., planted more than 15,000 seedling trees during the month of April. About half of these were used by the 4-H club members in planting small demonstration forests on their own farms. Farmers of the county who have been watching the growth of former 4-H forest plantings of this kind are taking an increasing interest in planting trees on their own lands. The county agent, W. C. Gist, reports that several thousand Norway spruces are being tried in the county for the first time this year, with the idea of using them for Christmas trees.



Windbreak and other trees on farms have been extensively cut in South Dakota for fuel during the past few years while practically no planting has been done to replace them, reports W. K. Williams, extension forester of the Office of Cooperative Extension Work. No forestry extension work is being conducted in the State.



More Farm Windbreaks Being Planted in Wisconsin

Farm windbreak planting in Wisconsin exceeded all past records during the spring of 1933 when over 2,600 windbreaks were planted by adults in 39 counties. In addition, 250 junior forest rangers used their annual supply of trees for planting as windbreaks instead of in woodlots.

In order to promote a better understanding of the care necessary to secure a high survival, good growth, and most efficient protection when the trees are grown, 41 half-day windbreak planting schools were conducted by Extension Forester F. B. Trenk during the winter and early spring months in 24 Wisconsin counties. These schools were attended by 1,558 persons.

Four-year-old transplant stock was furnished free of charge by the Conservation Department for these demonstrations. Approximately 275,000 trees were used.

Pines Planted in Nebraska in Erosion Control Project

Farmers in two western Nebraska counties—Morrill and Scotts Bluff—early in June completed the planting of 60,000 pine trees in soil-erosion control demonstrations directed by local county farm bureaus with the aid of Clayton W. Watkins, extension forester at the Nebraska College of Agriculture. The Burlington Railroad and local civic organizations and relief agencies also assisted in the project.

Wind erosion is so bad in this part of Nebraska that many farm fences are annually buried by the wind-blown soil. The farmers on whose lands the planting was done dread the job of digging out their fences each spring and hope that the trees will help protect their land.



“Woodchopping socials”, conducted along the lines of the traditional husking bee, have become popular in Caswell County, N.C., since one enterprising farmer invited the men of his community to assist him in cutting firewood from his woodland and to enjoy a good dinner. He had attended a timber thinning demonstration given by Extension Forester R. W. Graeber of North Carolina, and followed forestry methods in marking the trees he wanted cut.



A recent summary of the 1930 census reveals that the products of farm woodlands of New York State sold for \$16,269,000 during that year. There are 3,634,000 acres of such forest land in the State, according to J. A. Cope, extension forester. The principal product is fuelwood, followed in order by saw logs, fence posts, poles and piling, railroad ties, and pulpwood.

Kiwanis Club Sponsors 4-H Forestry Work in Oregon City

Under the sponsorship of the Kiwanis Club of Portland, Oreg., 4-H forestry clubs of that city are planning to acquire a forest for their own use. The tract selected is 300 acres of timberland logged in 1925 by the Brix Logging Co., located on the Columbia River about 20 miles from Portland. The company has offered to donate the land to the club, and the transfer will be made as soon as the title has been cleared.

Plans for the development of the tract include the planting of trees of all kinds, construction of trails and fire lines, and the building of a cabin.

Georgia to Hold Third Vocational Forestry Camp

At the Agricultural and Mechanical School at Clarkesville, Ga., the third annual vocational forestry camp will be held July 24 to August 12. Competitive examinations in forestry are given each spring to students of about 100 vocational agricultural schools of Georgia. The winners of scholarships as decided by these examinations are entitled to attend two camp sessions and earn a certificate of vocational forester. The Georgia State Forest Service has announced that 52 boys have won scholarships this year.



Nineteen fellowships have been awarded by the New York State College of Forestry for the year 1933-34; each scholarship carries a grant of \$500. Six of the winners will work for the Ph.D. degree and the other 13 for the master's degree. All recipients of the fellowships agree to give instructional assistance or do a limited amount of routine departmental work.



New laboratories for plant physiology and plant pathology were completed last year at Purdue University. The laboratories are built around greenhouse units and over basements equipped for controlled light, temperature, and humidity research.

Connecticut Plans Annual "Forestry Day" Program

July 26, 1933, will be "forestry day" in Connecticut, and a full day's program is being arranged. Meetings will be held at Storrs, the seat of the Connecticut State College. The possibilities of broader use of all classes of native forest products on the average Connecticut farm will be particularly emphasized, according to J. A. Gibbs, extension forester, who is arranging the program.

A State championship chopping contest is a feature of the day, and demonstrations of methods and equipment used in controlling forest and house fires will be given.



More than 82,000 trees were planted in 17 tree planting demonstrations held in New York State under the direction of George E. Stevens, State supervisor of forestry exhibits, during April and May 1933. School children and Boy Scouts participating in the demonstrations numbered 1,261. At each demonstration Mr. Stevens gave a brief talk on reforestation in New York and then instructed the workers in the actual planting operation.



Of the 80,000 seedlings planted this spring on Idaho farms, 56,000 were of black locust, says Stanley C. Clarke, extension forester of Idaho. Other species planted included Siberian elm, white ash, Norway spruce, and Scotch pine. Two hundred to three hundred farmers plant trees on Idaho farms each year on lands unsuitable for agricultural crops.



The new library in the Marshall Memorial Building of the New York State College of Agriculture, Syracuse, has been dedicated to the late dean of the college, Franklin Moon. It contains 11,000 volumes and 30,000 pamphlets on forestry and kindred subjects, and has up-to-date equipment for the research student.

Forest Service Notes

Land Purchases Approved by National Forest Reservation Commission

Acquisition of 433,908.78 acres of forest land by the Federal Government to be brought under the administration of the Forest Service was approved by the National Forest Reservation Commission June 9, 1933. The land can be acquired at a total cost of \$763,139.99, or about \$1.72 per acre.

The areas to be bought are all situated within existing national forests and purchase units. Projects of the emergency conservation program will be extended to many of them. The new units are in 16 States: Maine, New Hampshire, Vermont, Pennsylvania, Virginia, West Virginia, Kentucky, Tennessee, North Carolina, Georgia, Florida, Alabama, Arkansas, Michigan, Wisconsin, and Minnesota.

FOREST WORKER

Season of Burning Affects Character of Fire Damage

That fires at different seasons differ in the amount and character of damage they do has long been the contention of various observers. To throw some light on this question an experiment was conducted by the Lake States Forest Experiment Station at the Michigan Forest Fire Experiment Station in which four adjoining plots in an open stand of all-aged jack pine were burned over at various times during 1931 and the resulting damage noted. The conclusions reached may not be applicable to other types, but results of subsequent fire damage studies tend to substantiate them for jack pine. The following table gives percentages of total stand killed, by seasons and size classes:

Season of burning	0-to 1.9-foot height	2-to 6.9-foot height	7-foot height —3.9- inch d.b.h.	4-inch d.b.h. and larger	All sizes
	Percent	Percent	Percent	Percent	Percent
Early spring.....	99	95	26	0	84
Late spring.....	95	76	5	0	73
Summer.....	82	88	40	9	68
Fall.....	64	80	28	0	57
All seasons.....	86	89	26	2	72

As would be expected, mortality in general was greater in the smaller size classes and progressively less as size increased, regardless of season. In the smaller size classes, however, mortality was highest in spring, while in the larger size classes there was a marked increase in mortality in the summer.

In other words, spring fires in jack pine are particularly destructive of seedlings and saplings but do little damage to merchantable timber, while summer fires are less completely destructive of small trees but do considerable damage to trees in the larger size classes. The reason for this is that although spring fires, as a rule, make a complete burn they are confined to the surface litter and hence are not hot enough to damage seriously the larger trees, though they kill most of the small ones. Summer fires, on the other hand, burn deeper, are hotter, and are more apt to crown, and hence do more damage to large trees. Both summer and fall fires are inclined to be spotty, owing to the presence of green vegetation, and allow a larger proportion of the small trees to escape destruction.



Tests made recently on the Pike National Forest, Colo., confirm the results of earlier experiments which showed that Douglas fir planting stock can be stored in water for 3 weeks without serious injury and for 2 weeks without any injury whatever. The temperature of the water is apparently the secret of success—ice-cold running water holds the plants in a dormant condition and does not stimulate growth.

"Show Boats" to Visit Camps in Northwest

Two Forest Service trucks, known as "show boats", have started on a summer educational campaign to show forestry motion pictures and lantern slides at the Emergency Conservation camps of Washington and Oregon. One truck will cover all the camps in the 13 national forests of Oregon during the summer, having started June 6 on the Mount Hood Forest. The other truck started June 12 on the Columbia National Forest, Washington, and will cover camps on the 7 forests in that State.

The Oregon truck has been used in cooperative educational work in forestry for 6 years. One of the first such trucks in the United States, it is equipped with electric light plant, motion picture projectors, lantern slide machine, screen, and a collection of films and slides. The Washington truck is similarly equipped. George E. Griffith, of the Regional Office of the Forest Service, is in charge of the project. Each truck carries a crew of two men who show the pictures and give forestry talks.

New Plan for Grazing Fees on National Forests Announced

The Forest Service has completed a study to determine the practicability of relating grazing fees on the national forests to the market prices of livestock. Recommendations of the Forester have been approved by the Secretary of Agriculture and the following method of adjusting the grazing fees on national forest ranges has been adopted:

(1) The average national forest grazing fees of 14.5 cents per head per month for cattle and 4.5 cents per head per month for sheep in effect during 1931 will be used as the basis for making adjustments in the fees each year in accordance with fluctuations in livestock prices.

(2) The grazing fees to be paid each year on national forests will be adjusted so that the fees for any given year will bear the same ratio to the 1931 rate as the ratio which the average prices received by producers in the 11 Western States for the year preceding the year for which the fees are to be adjusted bear to corresponding average prices during the period from 1920 to 1932, inclusive, in the case of sheep, and during the period from 1921 to 1930, inclusive, in the case of cattle.

(3) The cattle fees to be paid each year will be adjusted on the basis of prices received for beef cattle as compiled by the Bureau of Agricultural Economics and the sheep fees adjusted on the basis of prices received for lambs likewise as compiled by the Bureau of Agricultural Economics.

(4) In adjusting the grazing fees for 1933 in accordance with the provisions of the preceding paragraphs, 4.13 cents will be considered the average price per

pound of beef cattle for 1932, and 4.18 cents the corresponding price for lambs; the average fee for 1933 as thus determined will be 9.05 cents per head per month for cattle, or 37.6 percent less than the average cattle fee determined by appraisal. For sheep the average fee in 1933 will be 2.05 cents per head per month, or 54 percent less than the average sheep fee determined by appraisal.

(5) The Forester is authorized to refund any amount collected for the year 1933 in excess of the adjusted fee, or to apply any such excess to the payment of any fees due or to be due, and to collect such additional payments as may be required to secure full payment of the fees as adjusted for the year 1933.

(6) No adjustments in fees shall be made when the application of the above formula would affect the fees by less than one half cent for cattle and one quarter cent for sheep per head per month, and in the establishment of all fees they shall be rounded off to the nearest cent for cattle and the nearest quarter cent for sheep per head per month.

(7) The Forester is authorized to make such adjustments from time to time as may be necessary to establish equitable fees between allotments, forests, regions, or States.

This plan will be applied in a broad way with no attempt to adjust fees on account of local conditions. To be fair to the public and stockmen the method must operate to increase the grazing fees as livestock prices increase. In the event of a decline in livestock prices, necessary reductions in fees will follow.

Forest Service Exhibit at Chicago Small But Effective

By H. R. KYLIE, United States Forest Service

The Forest Service exhibit at the Century of Progress Exposition in Chicago presents the nation's forest areas in their land-use aspect and illustrates the different forest values—timber, grazing, recreation, water, and utilization of forest products.

It was necessary to squeeze the exhibit, originally planned for a space 200 feet long and 50 feet deep into one 28 feet by 20 feet, and of course many plans had to be sacrificed. The smaller exhibit, however, carries out in a pleasing setting the same ideas originally intended for more elaborate exposition.

The background is a large canvas, painted by MacKenzie, showing the topography typical of different parts of the country and depicting areas adapted for grazing, timber growing, water development for power and irrigation, and recreation.

At one end of the canvas a 6-foot Douglas fir tree extends up to the ceiling, and through an opening in the bark the spectator can see, inside the tree, a miniature forest revolving and showing the various phases of management on which all forest values depend.

At the other end of the canvas a working model illustrates how the forest takes care of rainfall. Rain falls on two areas, one forested and one denuded. Immediately underneath, a glass section shows how the rainfall acts in finding its way down through the soil to the water table.

Large white-pine trees stand at each side of the exhibit on the aisle and between them a huge Douglas-fir stump, hollowed out into four segments and each lighted at intervals, shows a small part of the research work of the Forest Products Laboratory.

The exhibit is intended to tell visitors, first, that forests must be properly managed and their products efficiently utilized in order to yield their maximum values to the nation, and, second, that forests yield not alone timber but also water, forage, game, and recreation.

New Forestry Films Available and Proposed

Two new forestry films prepared by the Forest Service have been released, and a historical record in motion pictures of the various phases of the work of the Emergency Conservation camps is now in preparation. The two completed films, each 1 reel in length, can now be borrowed from the Office of Motion Pictures of the United States Department of Agriculture for the cost of transportation. They are:

"It Might Have Been You", portraying a disastrous forest fire that destroyed more than 23,000 acres of timber, burned 25 ranch houses, and rendered more than 100 people homeless in a period of 7 hours, all because of the carelessness of a ranch hand, and showing what the Forest Service is doing to prevent such catastrophes.

"The A. B. C. of Forestry", showing the beginnings of forestry—the growth of the tree from the seed; the structure of the tree; the use of water by the tree; effect on the forest of the removal of mature and defective timber. Proper methods of planting and felling trees, the effect of forests on rainfall and erosion and that of fire on the forest, are also shown.



Recreational facilities of the national forests of California will be improved through emergency conservation projects by the construction and improvement of 2,100 miles of trails, establishment of 725 new public camp grounds, and development of several hundred water systems, according to present plans of the regional forester.



The Pacific Northwest Forest Experiment Station has moved to new quarters in the New Federal Court House, Main and Sixth Streets, Portland, Oreg.

A Thinning and Pruning Operation in the Appalachians

By DONALD YOUNG, United States Forest Service

The Laurel Branch plantation was established in the spring of 1917 on the Nantahala National Forest in Macon County, N.C., on wornout farm land purchased by the Forest Service for \$4.25 per acre. Planting was done on 6 acres of impoverished sandy clay loam soil, underlain by granite, which was showing signs of erosion. The site was 3,000 feet above sea level. The cost of planting with 2-1 white pine stock from Cheshire, Conn., spaced 7 by 7 feet, was \$8.74 per acre.

In November 1932, the county welfare board allotted money to relieve unemployment in the community in which the plantation was located, to be used in thinning and pruning the plantation. Local citizens out of work were hired at the current rate of \$1 per 8-hour day. The money was a part of North Carolina's loan from the Reconstruction Finance Corporation.

Of the original stand of 888 trees per acre 76 percent, or 680, remained after 15 years. During this period, the canopy had completely closed in, limbs were dead 10 feet up the stems and had severe competition for the next 5 feet, and little light and wind reached the forest floor, on which fallen needles formed an undecomposed mat 3 inches deep. Measurements taken on three $\frac{1}{4}$ -acre plots after the thinning showed that the average tree was 4.9 inches in diameter $4\frac{1}{2}$ feet from the ground, 30 feet high, and contained 2.3 cubic feet of wood. For 15-year-old stands of pure white pine at Biltmore the average height is 25 feet and the average diameter 3 inches (U.S. Department of Agriculture Miscellaneous Publication 61). The largest tree was 8 inches in diameter and 45 feet high. The greatest height measured between whorls was 4.2 feet.

The trees to be cut were pointed out to two axmen by the ranger in charge of the work. Only those trees which were completely overtopped and would probably not live much longer and those trees of poor form the terminal shoots of which had been killed were removed. By this method three fourths of an acre per man day was thinned, which meant 111 trees (or 148 trees per acre) cut, leaving 532 per acre.

Since there is a ready market for clear white-pine house logs and rafters in the town of Highlands, N.C., 7 miles from Laurel Branch plantation, at an average price of 50 cents each on the stump, all the trees left after thinning were pruned to a height of at least 15 feet and the taller ones to a height of 20 feet. Straight double-edged pruning saws were used to prune the trees the first 6 feet, or as high as a man can reach with this short saw. One man could low-prune 75 trees per day. Curved single-edged pruning saws with handles 6, 10, and 17 feet long were used to complete the pruning to the desired height, which varied from 15 to 20 feet depending on the total height of the tree and the height of the adjacent limbs partially or completely shading it.

To assure one clear 16-foot log for the final crop all trees that could be pruned to 17 feet without slowing up growth were so treated. Limbs were undercut to prevent the bark peeling off and were cut as close to the bole as possible without injuring the bark of the tree. As in low pruning, 75 trees were high-pruned per man per day.

The costs per acre for treating the area by this method were \$1.33 for thinning, \$7.14 for low pruning (to 6 feet), and \$7.14 for high pruning (6 to 20 feet): a total of \$15.61. It is expected that in three years the limb scars will be completely healed and only clear wood will be grown for the height pruned. Future thinning will reduce the number of stems per acre so that the final crop will contain not more than half the present total. If 200 individuals per acre are removed by thinnings for house logs within the next 15 years, \$100 per acre may be realized on an outlay of \$28.60—the original investment of \$12.99 for land and planting plus \$15.61 for pruning and thinning after 15 years. This would still leave more than 300 trees per acre remaining for the final crop.

The number of stems per acre was reduced approximately one fifth by the thinning operation. Growth of individuals left should increase with reduction in competition for moisture, and the soil should be enriched by the disintegration of the ground cover which sunlight and wind can now reach.

Cold Storage of Planting Stock in Bales

By GALEN W. PIKE, United States Forest Service

On April 8, 1932, 310 bales containing 2,000 to 3,000 ponderosa pine seedlings each, shipped from the Bessey nursery in Nebraska to the Black Hills National Forest, S.Dak., were stored in the egg room of an ice and storage plant to be kept until they could be planted. Some bales were removed daily as required on the planting project.

The stock was 2-0 ponderosa pine, packed in shingle tow. The bales were piled in tiers four high with two 2-inch poles between each layer and a 6-inch space between tiers. A temperature of $32\frac{1}{2}$ ° F. was maintained in the room. To prevent molding in the egg cases, dry sawdust was kept in the room to absorb any moisture.

After two weeks some of the bales were getting dangerously dry and a few felt warm instead of cool. The bales were immediately transferred to another room where the temperature varied from 33° to 42° F., but where they could be watered. They were all watered thoroughly and repiled. Watering was repeated every 10 days or as often as appeared necessary.

The burlap wrappers started to mold after 45 days, but no mold was found on the trees or the shingle tow, probably because of the 1 percent Volck solution dipping treatment that had been given at the nursery before shipping as a sanitation measure to guard against the spread of the rust *Peridermium harknessii*. The last

of the bales, removed after 52 days in storage, were in perfect condition except that $\frac{1}{2}$ - to $\frac{3}{4}$ -inch buds had started.

It appears from observations of the stock during storage that some arrangement to control humidity as well as temperature is necessary before planting stock can be successfully held for indefinite periods.

Why Seedlings Are Favored at the Monument Nursery

By W. H. SCHRADER, United States Forest Service

Because the results of field experiments with Douglas-fir seedlings favored the use of transplants, the entire output of this species from the Monument Nursery, Pike National Forest, Colo., up to 1922, was transplant stock. In that year root rot made its appearance in the Douglas-fir beds. Field experiments began to indicate that Douglas-fir seedling stock was equal and in many instances superior to the best grade of transplants, although the transplants were stockier and had a much better root development than the best seedlings.

In our attempts to find out the cause of this change, samples of seedlings and transplants were dissected under the microscope. This revealed that the stringy roots of the seedlings were alive and vital to the tips while a large percentage of the fine fibrous roots of the transplants were dead. After these dead portions of the roots were clipped out only a framework of the larger roots remained. Root rot is believed to be the cause of this dying back of the finer roots of the transplants.

When seedlings are dug up, they suffer a severe breaking and bruising of both lateral and terminal roots. Seedlings planted in the field are put in new soil, while those which go into transplant beds are placed in soil with a strong culture of root-rot fungus. This fungus seems to gain entrance at the bruised tips and eats its way through the new root growth. Root-pruned seedlings usually show a little indication of this rotting near the pruned tips, but it is never very extensive, probably because only the terminal roots are cut and the cutting is done deep in the soil.

The use of aluminum sulphate on seed beds will insure a healthy growth of roots, but experiments with this chemical on transplant beds have been without favorable results to date.



The use of airplanes for scouting going fires and for forest patrol following lightning storms and during periods of haze and fog when visibility from ground lookouts is poor, will be continued in the California region of the Forest Service in 1933, contracts for such service having been recently awarded.

During the 1932 forest-fire season in California the flying time on emergency fire patrol was 125 hours in northern California and 88 hours in southern California.

Acorns From the Same Tree Tend to Be Uniform

By O. M. WOOD, United States Forest Service

Casual examination of the acorns produced by selected seed trees of chestnut oak (*Quercus montana* Willd.) during five successive years called attention to the distinctive size and shape of the acorns of an individual tree, and suggested a study to confirm this observation.

By establishing a correlation between size and weight of acorns, Korstian, in Factors Controlling Germination and Early Survival in Oaks (Bulletin 19 of the Yale School of Forestry), has shown that weight can be used as a criterion of size. This measure was therefore used to determine the uniformity in size of the acorns produced by a single chestnut oak in southern New Jersey. The tree was 51 years old, 8.8 inches in diameter at breast height, and 40 feet high, with a projected crown area of 650 square feet. In 1932 it produced a total of 556 acorns which were collected in a seed trap. From this lot a 24 percent sample was picked at random and each acorn was weighed. The frequency distribution shown in the table was determined from these weights.

Weight group	Frequency
Grams	Percent
3.6- 4.5	0.75
4.6- 5.5	5.22
5.6- 6.5	17.16
6.6- 7.5	30.60
7.6- 8.5	32.84
8.6- 9.5	9.70
9.6-10.5	2.98
10.6-11.5	.75
	100.00

According to this grouping, more than 63 percent of the sample acorns weighed from 6.6 to 8.5 grams and more than 80 percent weighed between 5.6 and 8.5 grams.

No readily applicable criterion exists for measuring the shape of acorns, but from casual observation it is quite apparent that each tree bears acorns of a distinctly uniform shape. A comparison of acorns collected in each of 5 years from one tree indicates that this uniformity persists for that period at least, and may exist throughout the life of the tree.



Twenty-five surveyors and engineers who will be employed by the Forest Service on emergency conservation work are being taught Forest Service methods of locating truck trails in the mountains of California at a field camp about 12 miles south of Livermore, Calif. C. E. Young and T. E. Davidson of the California Region of the Forest Service are in charge of the camp.

General Forest News

Thick Bark Protects Pine Beetles From Fatal Subzero Temperatures

By F. P. KEEN, United States Bureau of Entomology

That bark beetles are frequently killed by low temperatures has been well established through laboratory experiments and field observations. J. M. Miller, in a series of experiments at the California station of the Division of Forest Insects, Bureau of Entomology, found that overwintering broods of the western pine beetle (*Dendroctonus brevicomis* Lec.) started dying at 0° Fahrenheit and were all killed at 15° below zero. In 1924 and again last winter subzero weather in eastern Oregon and northern California caused widespread mortality among these bark beetles infesting ponderosa pine. As such weather is not uncommon in the pine belt of eastern Oregon, the questions naturally arose, "How is it possible for native pine-beetle broods to escape complete destruction every few years when air temperatures of from 15° to 35° below zero are recorded?" and "To what extent does the bark offer protection?"

To obtain further information on these points, J. A. Beal and W. J. Buckhorn of the Portland (Oreg.) office of the Bureau of Entomology, made a trip to the Ochoco National Forest on February 7, when a period of subzero weather was forecast by the Weather Bureau. Two mercury thermometers were placed beneath the bark of each of six infested ponderosa pine trees of different bark thicknesses—one thermometer on the north and one on the south side. In addition, six minimum thermometers were placed in other beetle-infested trees. Air thermometers were hung close by, and two thermographs were put in operation. Soon after the thermometers were put in place, the air temperature started dropping over a 28-hour period until a low point of 26° below zero was reached. Readings on all mercury thermometers were taken at hourly intervals day and night over a 66-hour period and the minimum thermometers were read daily.

The records obtained showed very definite relationships between air and bark temperatures. Temperatures under thin bark responded within an hour to any marked change in air temperature, while in thick bark there was approximately a 2-hour lag. As might have been expected, the bark did not cool so rapidly as air temperature, and the thicker the bark the more slowly did it respond. At the low point of air temperature, 26° below zero, thin bark one-half inch in thickness remained 8° warmer; 1-inch bark was from 18° to 21° warmer; and 2-inch bark stayed 29° warmer, reaching a low of 3° above zero. Thus only in thin and medium thick bark were temperatures reached which are known to be fatal to the beetles.

In bark which reached temperatures of 11°, 14°, and 17° below zero, subsequent examination of the broods showed mortality of 55, 64, and 73 percent, respectively. Either these temperatures do not give so high a percentage of kill in the field as under laboratory conditions, or the Oregon beetles represent a hardy strain capable of surviving the cold weather common to their native habitat. If the rate at which temperature in the thick bark dropped were maintained with steadily decreasing air temperature, it would require an air temperature of 60° below zero to bring all bark down to temperatures completely fatal to all the beetles. Since such low temperatures are never known to occur in the pine belt of eastern Oregon, beetles in thick bark are able to survive and perpetuate the species.

However, this study shows the importance of low temperatures in destroying bark-beetle broods and controlling epidemics and gives a basis upon which to judge the effectiveness in causing beetle mortality of low air temperatures which may occur in forests infested by the western pine beetle.

American Beeches Threatened by Disease

By R. KENT BEATTIE, United States Bureau of Plant Industry

A disease which was probably introduced from Europe is threatening to do to the American beech what the blight did to the chestnut. More than a third of the beech trees of Nova Scotia and many in New Brunswick have been killed by this disease, which is the result of a fungus working in partnership with an insect. Recently the fungus, a species of *Nectria*, has been found killing beech trees at several places in Maine, and the insect, the felted beech scale, is already known to occur in Maine, New Hampshire, and Massachusetts.

Control or eradication measures must await determination of the further distribution of this disease.



The Schlich Memorial Fund, the interest on which is awarded each year in rotation to a division of the British Empire or the United States, was allocated in 1932 to the Union of South Africa. According to the Director of Forestry of the Union it will be invested to give a yearly prize to the best student at one of the two schools of forestry there.

The 1932 prize money, which was received by the United States, through the decision of the Society of American Foresters will be used for a medal or certificate to be awarded periodically for some noteworthy achievement for the advancement of forestry in this country.

Present Status of the Dutch Elm Disease

Eradication measures appear to have been successful in wiping out the Dutch elm disease in Cleveland and Cincinnati, Ohio. Although it had been previously found in these localities, scouting failed to discover further evidences of it there in the season of 1932, according to R. Kent Beattie, forest pathologist of the Bureau of Plant Industry.

Many specimens from other parts of the United States have been received and cultured at the Dutch Elm Disease Laboratory at Wooster, Ohio, so far with negative results, but lack of funds prevents the general and intensive survey of our principal elm States which should be made to find this serious European disease before it can establish itself here.

Measuring the Quantity of Water Consumed by Watershed Vegetation

That a gap exists between the quantity of rain falling on a given watershed and the total run-off has been shown (1) but there is little information as to whether this loss is due entirely to evaporation and transpiration from vegetation or as to the quantity of water actually so lost. Harry F. Blaney, of the United States Bureau of Agricultural Engineering, reports on some experiments in measuring this loss conducted by that Bureau in southern California, in the Proceedings of the American Society of Civil Engineers, December 1932.

In evaluating evapo-transpiration losses of drainage basins, writes Mr. Blaney, it is desirable to divide the watershed into two areas—drained slopes and canyon bottom. Water conservation, so important in southern California, cannot be accomplished by removing brush from drained slopes without incurring danger of damage by erosion that would more than offset the value of the water saved. Reduction of water losses in canyon bottoms is more promising, but it is necessary to know as nearly as possible the exact quantity of water lost in such areas through vegetative cover. Experiments of the Bureau of Agricultural Engineering in Temescal Canyon, 4 miles southeast of Corona, Calif., in the spring of 1929 (2) showed that for a 30-day period, April 28 to May 27, inclusive, the total evapo-transpiration was 12.9 acre-inches per acre. The vegetation in the canyon consisted of willows, tules, and kindred moist-land growths.

In 1931, this investigation was extended to Coldwater Canyon, near San Bernardino, Calif., (3) and methods were developed to measure the evaporation and transpiration losses in canyon bottoms. One of these methods was to measure losses of stream flow between two bedrock controls, located about 2,100 feet apart in the canyon. The canyon bottom was 30 to 50 feet wide and the vegetation mostly alders, with some sycamores, bays, oaks, and herbaceous growth. During the period of record there were no visible indications of

water reaching the section under study other than that passing the upper control. At each control a low concrete dam was built across the stream channel on a bedrock foundation, and a measuring flume with water-level recorder was placed at one end of each dam for the purpose of measuring the flow of water passing into and out of the experimental section of the canyon between the controls. At first, values for the gauge height for each hour were used in computing the volume of water passing the two controls and the daily loss was obtained by subtracting the volume of water passing the lower control from the volume passing the upper control. In order to eliminate a large part of this laborious process, a flow recorder that solved the flow formula mechanically was attached to the water-stage recorder.

The relative amounts of the indicated losses chargeable separately to evaporation and transpiration are difficult to determine. However, it has been indicated (4) that the rate of evaporation is relatively low when the temperature of the water is below that of the overlying air, and since this condition exists in Coldwater Canyon throughout the growing season it may be assumed that evaporation is small and that the loss indicated by the daily drop in stream flow is due principally to transpiration.

From the Coldwater Canyon measurements it is estimated that the consumptive use of water by canyon-bottom vegetation during the 6-month summer season, May to October, was 45 acre-inches per acre of canyon bottom, 238 acre-inches per mile of stream, or a depth of 0.10 inch over the Coldwater watershed per mile of canyon bottom.

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A United States court of appeals decision recently reversed the ruling of the Federal Trade Commission that the name "California white pine" could not be used for ponderosa pine. The commission held that the species was not botanically a true white pine and that the term was confusing to the trade. Twelve California and southern Oregon lumber companies appealed from this decision, maintaining that the species had been designated by the trade name "California white pine" since the beginning of the lumber industry in the region, that the name was not confusing to purchasers, and that the wood of the species is white, of soft texture, and possesses the general characteristics of the soft pine species.

How Timber Is Helping the Southern Farmer

By W. R. MATTOON, United States Forest Service

As a source of cash income, as building material, and as fuel, timber has been playing an important role on the Southern farm during the economic crisis. Timber from farm forests sells as fuel wood, posts, poles, cross-ties, saw logs, and pulpwood. In the 12 Southern States in 1930, forest products cut and sold from farms ranked fourth among all agricultural crops as a source of income. Only the returns from cotton, tobacco, and potatoes exceeded those from forest products, while those from all truck crops were less. On the basis of cash receipts for sales from farms, according to estimates of the Bureau of Agricultural Economics, forest products ranked second in Alabama, Arkansas, Mississippi, and Virginia; third in Georgia, North Carolina, South Carolina, and Tennessee; and eighth in Florida, Louisiana, and Texas. The total amount received in 1930 from sales of timber in these States and Oklahoma (where receipts from forest products took ninth place) was \$82,436,000.

In building construction there has been a return to pioneer methods in the South. Logs, poles, and split shingles (known as "boards") are being extensively used for building homes, barns, curing-houses, and sheds. Chimneys are being made of sticks and mud. Many small utensils and implements are being fashioned out of wood, and timber is being utilized for all kinds of repair work.

In all the Southern States farmers are cutting and using more wood for fuel than they did a few years ago. They are saving money by not buying other forms of fuel, but scarcely realize the value of the wood they burn. The average Southern farm requires 15 cords of wood for fuel yearly. In 1929, as shown in the 1930 census, the farmers in the 12 Southern States cut 16,800,000 cords of fuel wood from their farms. At an estimated value of \$4 per cord, this meant a total of \$67,200,000. Besides that used on the farm during the past winter another large amount of fuel wood was shipped by rail and truck and sold in the towns and cities. In Texas the continued high price of natural gas resulted in a sweeping return to wood for fuel. According to reports, a full year's supply of wood ready for the furnace was obtained for the courthouse of Winn Parish, La., at the cost of 1 month's gas fuel bill.

In addition to the above benefits, the woods have supplied fertilizer for the farmer's field crops. The litter and humus on the forest floor, with their content of nitrogen, phosphoric acid, and potash, have been taken to enrich agricultural soil or utilized by cutting out the timber and planting other crops on the land. Clearing up of the woods for this purpose has greatly increased since 1929. Some of the timber so cut has been used or sold but unfortunately a good deal has been burned and wasted.

Depletion of timber stands in the South, however beneficial the use of the wood may be to the farmers at present, carries with it a danger. Are all these stands restocking naturally? For future rural prosperity, stands of trees of all age classes are absolutely necessary. It is widely believed in that region that fields "turned out" will quickly come back to pines. This is often a fallacy. They did reforest well 20 to 40 years ago, when there were many old "forest" pines which scattered large quantities of seed from their 100-foot crowns. But today in many places there is adequate reproduction only along margins of fields, while, on many areas, widely separated bush-pines or crops of weeds and broom sedge are the rule. The situation calls for aggressive action on the part of foresters and forestry agencies in the South to get young trees started on the lands that are being abandoned. Where seed trees have not been left, planting will be necessary. The rural communities of the region need to be awakened more fully to the necessity of providing for a future timber supply.



Evidence that the forest of Alaska is moving north was recently presented before the Ecological Society of America by Prof. Robert F. Griggs of George Washington University. Trees less than a hundred years old form a 1- to 3-mile-wide border to the older forest. These younger trees are growing as rapidly as any trees of the same species and reproducing freely, and the forest is steadily expanding toward the north. Botanists in the Scandinavian countries, also, have reported that the northern forests are advancing farther into the Arctic.



In order to insure a perpetual supply of pulpwood for its mills, the Southern Kraft Corporation is reforesting with pines and protecting from fire its property of 1,000,000 acres of cut-over lands in five Southern States. The annual rate of growth of the trees will be determined, and when they reach pulpwood size only the amount of wood that is being replaced by growth will be cut each year. The company's system of fire protection includes lookout towers, fire lanes, telephone lines, improved roads, and the employment of local patrolmen.



Examination of plantations established in 1932 in the Tioga State Forest, Pa., disclosed the fact that deer had nipped the tops of about 40 percent of the hemlock, 2 percent of the larch, and 2 percent of the Norway pine trees. In another section of the forest deer were reported to have damaged 5 percent of the trees planted last year.

Individual Planting Records Held by New York and Georgia Owners

Nearly 7,000,000 tree seedlings have been planted by two private landowners in the United States since 1915. Thomas F. Luther, of Mechanicville, Saratoga County, N.Y., planted 5,473,600 trees between 1915 and 1932, reforesting about 5,500 acres. Of these trees, 2,506,500 were white pine, 961,400 Norway pine, and 53,000 Norway spruce, the remainder being of miscellaneous species. Mr. Luther reports average survival of 70 to 80 percent, the most successful species being Norway pine.

James Fowler, of Soperton, Treutlen County, Ga., began planting trees on his worn-out and abandoned cotton fields in the spring of 1926. He dug up and used 1-season-old natural stock of slash pine. The success of the first plantings and the prospect of developing turpentine pine orchards on his poorer land stimulated him to larger operations. Mr. Fowler probably now holds the record as the largest private individual planter in the Southern States. To date he has reforested close to 2,000 acres, at an average rate of 750 trees per acre, or a total of 1,500,000 trees, practically all of which are slash pines.



The greatest difficulty in manufacturing paper pulp from southern pines is not caused by the resin, as was anticipated, but by the great difference between the spring and summer wood, according to W. G. MacNaughton, research chemist and assistant to Dr. Charles H. Herty at the Georgia Pulp and Paper Laboratory at Savannah, Ga. The two kinds of fibers are so different that it is like dealing with two different species in one, says Mr. MacNaughton.



Experiments with calcium chloride as a possible forest fire retardant are reported by Paul W. Stickel, of the Northeastern Forest Experiment Station, in the *Journal of Forestry* for May 1933. Mr. Stickel concludes that although this chemical may have a limited value as a preventive of fires because of its ability to increase moisture content and decrease inflammability, the beneficial effect is rapidly destroyed by heavy precipitation. As an aid in extinguishing fires it is of practically no value because of the slowness with which it absorbs water under fire conditions.



The custom of burning chaparral roots for fuel in open fireplaces in the West has declined on account of their tendency to explode, says Cyril S. Robinson, junior range examiner, Santa Barbara National Forest, Calif., quoting the explanation offered by a foothill rancher and woodcutter: "When once burnt

over and regrowth covers the burnt root crown, a sealed air chamber is often formed. When heated, the air-charged chamber explodes." Mr. Robinson vouches for the explosions, which are sometimes so violent as to blow sparks and ashes all over the room.



Supervisory personnel to the number of 20,000 is authorized for all Emergency Conservation camps. This includes superintendents, foremen, foresters, engineers, clerks, and blacksmiths. The number of such employees in the camps already established is running between 10 and 15 for each camp, according to the size of the camp and the nature of the projects. At present there are 591 camps on national forests in all parts of the country and 755 on State lands.



At the 1932 Congress of the International Union of Forest Research Organizations an international system for the classification of forest literature, which had been under preparation for some time, was adopted. The committee for bibliography now includes the following members: Messrs. Troup, Great Britain (chairman); Perrin, France; Weber, Germany; Jedlinski Poland; and Flury, Switzerland.



Creosoted wooden piling that is protected from rapid circulation of air loses very little of its creosote content over long periods. The buried portions of creosoted piles removed at Old Spanish Fort on Lake Pontchartrain, La., after more than 40 years' service, could not be distinguished from freshly creosoted piles.



It is reported that the total length of the portable wooden snow fences in use in the United States to prevent snow from drifting on to roads is probably 50,000,000 feet, and that new fence and replacements require 10,000,000 to 15,000,000 board feet of wood annually. The use of such fences is said to be increasing.



Stockton, Calif., 90 miles from the Pacific Ocean, is being developed as a fresh-water port. Tributary to the city are some of the finest stands of sugar pine and ponderosa pine in the State.



A Japanese walnut (*Juglans sieboldiana* Max.) in the arboretum of the Pennsylvania Forest Research Institute grew 7.85 feet in 1932. The tree is now 7 years old from the nut. It was 10 feet tall in the spring of 1932, and almost doubled its growth in one season.

Foreign Notes

Protection Forests in Yugoslavia¹

Of the total forest area of Yugoslavia, 66 percent, or 5 million hectares (12½ million acres), is classified as protection forest. The general forestry law of December 21, 1929, provides for permanent and temporary protection forests. Both kinds are designated by the governor in each province upon application by forestry officials, landowners, or other interested parties, and after examination and hearings by forestry experts. Forests belonging to any class of owner—private, communal, or State—may be declared protection forests.

Permanent protection forests are those which require special treatment for natural reasons, i.e., to protect the soil, prevent torrential run-off, protect water supplies, etc. Restriction on the handling of such forests is in the interest of the owner as well as the general public, consequently the former is not entitled to compensation because of such restrictions. These seldom go beyond the general prohibition of clear cutting or other measures that will result in devastation, although the Government may prescribe special measures for maintaining the protective effect of the forest. All protection forests are required to be managed according to approved working plans.

Temporary protection forests are those which afford protection or benefits outside of their borders, and primarily to other persons than the owners. Such, for instance, are those serving as windbreaks, those protecting highways, railroads, or buildings, and those needed for reasons of national defense. Restrictions on the handling of these forests vary according to circumstances and may go considerably farther than in the case of permanent protection forests, but they are effective only so long as the need for protection exists. The owner is entitled to compensation from those benefiting from the restrictions and may require them to purchase the forest where the restrictions are particularly burdensome.

Land which is not now forested may also be classified as protection forest where suitable for forest growth and where the existence of a forest is desirable for protective reasons. Afforestation of such land may be required, with suitable assistance by the State.

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The Ontario Department of Forestry distributed 13,000,000 trees to farmers of the Province last year, an average of 4,000 trees to each farm resident.

¹ Based principally on information obtained by Arthur C. Ringland, European forestry specialist of the United States Forest Service, through correspondence with Dr. A. Ugrenovic, professor at the University of Zagreb, Zagreb, Yugoslavia, whose influence is reflected in the forestry laws of that country.

Plant Quarantine Restrictions of Norway Affecting Trees

A summary of plant quarantine restrictions in force in Norway, published by the United States Bureau of Plant Quarantine under date of March 1, 1933, contains the following orders concerning forest tree species:

Seeds of all species of *Picea* and *Pinus* from foreign countries, except those of *Pinus cembra* and *P. sibirica*, shall be treated by the customs with a staining solution before release for importation.

The seeds must be packed in sacks stenciled in red "Utenlands Frø" (Foreign Seeds) on each side of the sacks * * *

Before release by the customs, the seeds shall be colored in the following manner: At different places on the sack small quantities of a solution of eosin (8 grams eosin dissolved in 1 liter of alcohol) shall be injected with a syringe; 155 cc of solution must be used for each 10 kilograms of seed.

Until further notice *Graphium ulmi* Schwarz will be regarded as a fungus which is dangerous to plants, shrubs, or trees.

The importation of plants of any species of the genus *Ulmus* is prohibited.

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British Columbia Seed Used in England

Continuing the reforestation operations that have been carried on in Great Britain since 1921 in an effort to overcome the damage caused by cutting during the war, the Imperial Forestry Commission, London, imported this year from British Columbia 800 pounds of Sitka spruce seed, gathered on Queen Charlotte Islands, 20 pounds of western hemlock seed, 40 pounds of western larch seed, 25 pounds of red alder seed, 20 pounds of white fir seed, 35 pounds of Douglas fir seed, and 75 pounds of lodgepole pine seed.

This is the first year that alder seed has been among the species exported. Because of its rapid growth, it will be used in planting windbreaks or as cover for coniferous seedlings.

¶

The tendency of a water-soluble salt used as a preservative against decay of wooden poles to climb up the sapwood to the top of the pole when it is placed in the ground has been the subject of investigation by the Forest Products Laboratories of Canada. Results indicate that poles treated with such water-soluble preservatives as zinc chloride are not immune for an indefinite time to fungus attack in the vicinity of the ground line, the most vulnerable point, because of this tendency.

Forest Fires and Weather in Japan

In a paper published in *Nature* (London), T. Terada and T. Utigasaki state that the annual loss due to forest fires in Japan is second in magnitude only to that suffered by the United States. The article continues:

Japanese meteorologists might therefore do good service by studying the weather conditions that precede these fires in Japan and perhaps eventually organizing a system of warnings, following the example of the United States. The authors of this paper were led to study this subject with the aid of synoptic weather charts through the known tendency for the fires to break out practically simultaneously in widely scattered parts of Japan. They conclude that such outbreaks are generally associated with the near approach of the "squall-line" or principal cold front of a depression following an easterly track north of Japan, when the warmer of the two wind currents yields maximum temperatures of 20° C. or more. There seems no appropriate reason why the front should have anything to do with the matter; it is easy to imagine that the necessary antecedent conditions are merely a sufficiency of wind and warmth, with no rain and perhaps some special state of the air in regard to its water-vapour content. These conditions might seldom occur except on the approach of a depression * * *.

A Simple Method of Treating Poles Used in Sweden

A new and simple method for treating poles and posts to lengthen their period of service is described in the Swedish forestry journal "Skogen." It is based on the ability of wood to absorb and conduct through its pores a solution of an aseptic or antiseptic nature. In the instance described a sodium fluoride preparation was used.

Tests were made with pine poles 30 feet long and 7 or 8 inches in diameter at the base. Each post or pole was set with its base encased in a sheet iron can containing about 2½ pounds of the preservative. The lower part of the hole was packed with stones to keep earth from contaminating the contents of the can.

Within a year after the poles were set, the preservative solution had reached a height of 20 feet, and a study made after 3 years showed that it was effec-

tive up to 26 feet. The poles were examined and found to be completely sound and thoroughly impregnated except for a small part of the upper end and the dense, naturally durable heartwood. For this reason it is advised that the tops of posts and poles treated as described should be protected with a cap of zinc or other durable metal and the part above 25 feet given a brush treatment with some liquid preservative.

Producing Japanese Dwarf Trees

The development of dwarf trees as practiced in Japan is the reversal of nature's method, and consists in nurturing the unfittest. The system of culture used is described in *Garden Life*.

First, a poor, weak seed is chosen for planting. As soon as it has sprouted and attained a little growth the leading shoot is trimmed off. The plant then grows two other shoots. These are carefully watched, and when one exhibits a strength and vitality greater than its fellow it is at once cut off and the weaker shoot left to form the future dwarf tree's main stem or trunk.

This system of trimming and cutting is followed punctiliously; water is seldom used, and only in such small quantities as actually to keep the plant alive; the tree is kept in a pot too small for its full development; and the roots are constantly pruned. The shoots are carefully trained and bent to follow the growth of a large tree. After about 5 years of such training the little tree can be left to itself and trusted not to strike out again in pursuit of its natural size and vigor.

Some of the specimens of Japanese dwarf trees are very beautiful and compare in form, though not in size, with their forest-grown brothers.



According to figures compiled by the Canadian Forest Service, 30.7 percent of the wood cut annually in Canada is used for fuel. A larger amount, 38.2 percent of the total quantity, goes to the sawmill; pulpwood is the third most important use, 24.2 percent being thus consumed. Railroad ties, fences, poles, and piling require from 5.75 percent of the total to 0.5 percent each.

Personals

Robert Y. Stuart, United States Forester, received the honorary degree of doctor of science from Dickinson College June 12, 30 years after his graduation in the class of 1903.

John D. Clarke, Representative from New York, has been appointed a member of the National Forest Reservation Commission to succeed Representative W. C. Hawley, of Oregon. The Commission is now

composed of George H. Dern, Secretary of War, Harold L. Ickes, Secretary of the Interior, Henry A. Wallace, Secretary of Agriculture, *ex officio* members; and Senator Henry W. Keyes, of New Hampshire; Senator Walter F. George, of Georgia; Representative Wall Doxey, of Mississippi; and Representative Clarke. Mr. Clarke has shown great interest in forestry and is co-author of several important forestry measures, including the Clarke-McNary Act.

FOREST WORKER

T. S. Goodyear was appointed State supervisor of forestry in Washington on May 1, 1933, to succeed George C. Joy, who resigned on April 1. Mr. Goodyear has been with the State division of forestry since 1917, for the past 8 years serving as assistant State supervisor. He is a graduate of the school of forestry of Washington State College.

A. W. Middleton has been appointed State Forester of Idaho to succeed Ben E. Bush, who had held the office since its creation in 1925. Mr. Middleton attended the Oregon School of Forestry for 1 year, and later graduated from the College of Agriculture of the University of Idaho. He has had practical experience in the United States Forest Service.

John Snow has been appointed State forest supervisor of South Dakota to succeed Theodore Shoemaker, who had held the position since 1918.

W. R. Hine has been designated assistant to Fred Morrell, chief of the branch of public relations of the United States Forest Service, in connection with the emergency conservation work program in the States. Mr. Hine has held the positions of State forester of Louisiana, district inspector of the Gulf States District, United States Forest Service, and executive secretary of the Society of American Foresters.

Alfred A. Doppell, who for the past year has been acting assistant State forester of Maryland, is now employed as assistant to G. T. Backus, district forest inspector of the Middle Atlantic District, in connection with emergency conservation work in that district.

Aldo Leopold has been placed in charge of erosion control in connection with the emergency conservation work program in the Southwestern Region of the United States Forest Service. He will give particular attention to the correlation between erosion control, forest-cultural operations, and game problems. Mr. Leopold was formerly assistant regional forester in that region. In 1924 he transferred to the Forest Products Laboratory, from which he resigned as assistant director in 1929. Since then he has been in charge of a game survey for the Sporting Arms and Ammunition Manufacturers' Institute.

R. S. Maddox, former State forester of Tennessee and more recently assistant forester of Virginia, has accepted appointment in region 7 of the United States Forest Service as staff assistant to the supervisor of the Monongahela National Forest, W. Va., in connection with Emergency Conservation Work.

George H. Cecil, executive secretary of the Los Angeles County Conservation Association, has been appointed special inspector of forestry projects to be carried on in the 57 Emergency Conservation camps to be established in the 4 national forests of southern California.

Emanuel Fritz, associate professor of forestry at the University of California, has been elected a member of the council of the Save-the-Redwoods League.

Hugo Winkenwerder, dean of the college of forestry at the University of Washington, has been appointed acting president of the university to take effect on the resignation of the president June 30.

Officers of the Gulf States section of the Society of American Foresters for the present year are: G. H. Lentz, Assistant Regional Forest Survey Director of the United States Forest Service, chairman; P. M. Garrison, forester of the Great Southern Lumber Co., vice chairman; and Robert Moore, extension forester of Louisiana, secretary-treasurer. The 1933 annual meeting of the section was held jointly with the Association of Southern Agricultural Workers at New Orleans.

The Washington section of the Society of American Foresters has reelected J. P. Kinney, director of forestry of the Bureau of Indian Affairs, United States Department of the Interior, chairman for a second year. A. E. Fivaz, of the Division of Blister Rust Control of the United States Department of Agriculture, was reelected vice chairman, and W. A. Dayton, of the United States Forest Service, was elected secretary-treasurer.

James A. Howarth, forest supervisor of the Quinault Indian Reservation at Hoquiam, Wash., for several years, was transferred June 15 to the Klamath Indian Agency, Oreg., where he will take the place of Fred R. Moffat, forest supervisor, who went to Hoquiam on the same date.

The Georgia Forestry Association at its 12th annual meeting reelected all its officers. They are: T. G. Woolford, president; Ogden Persons, first vice president; Jack Williams, second vice president; J. Phil Campbell, third vice president; Joseph A. McCord, Sr., treasurer; and Bonnell Stone, secretary. C. B. Harman is chairman of the executive committee. Mr. Woolford has recently been elected by the United States Chamber of Commerce a director of that organization.

The original building of the New York State College of Forestry has been named Bray Hall, in honor of William L. Bray, who gave the first forestry courses at Syracuse University, was the first head of the college in 1911, and has instructed almost continuously in botanical subjects at the sophomore summer camp of the college on Cranberry Lake. He is now dean of the graduate school of Syracuse University.

Aubrey R. Watzek was reelected president of the Oregon Forest Fire Association at a meeting this spring. Other officers elected are: George B. McLeod, first vice president; Earl B. Tanner, second vice president; R. H. Chapler, secretary and manager. Members of the board of managers include C. S. Chapman, R. D. Moore, Earl G. Muir, H. R. Irish, C. L. Starr, R. M. Fox, E. B. Tanner, J. R. Frum, and Wells Gilbert.

Dow V. Baxter and John Ehrlich have been awarded fellowships for the study of forestry abroad by the Board of National Research Fellowships in the Biological Sciences of the National Research Council, which made 26 reappointments and 41 new appointments for 1933-34.

Dr. Baxter received his B.S. degree in forestry in 1921, his M.S.F. degree in 1922, and his Ph.D. degree in forest pathology in 1924, all from the University of Michigan. He has taught botany at the Universities of Michigan and Wisconsin, and forestry at the University of Michigan, where he is at present associate professor of silvics and forest pathology. He has spent several summers in field work for the Bureau of Plant Industry of the United States Department of Agricul-

ture. His fellowship study will take him to Alaska for 3 months, where he will work at the regional headquarters of the United States Forest Service at Juneau; to Stockholm, Sweden, for 3 months; and to Washington, D.C., where he will spend 3 months working with the division of forest pathology of the Bureau of Plant Industry.

John Ehrlich received the degree of B.F. from Cornell University in 1928; that of A.M. from Duke University in 1929; and the M.F. degree from Harvard University in 1930. From 1931 to 1933 he was Anna C. Ames Memorial scholar at Harvard and in 1933 received the Ph.D. degree in forest pathology. His study under the fellowship will be done at the Imperial Mycological Institute at Kew, England.

Bibliography

An Outstanding Book on Game

By C. E. RACHFORD, United States Forest Service

Mr. Leopold's volume² is a monumental work, the first of its kind. It supplies an urgent national need.

The subject is of national importance. Wild game has had the thought and study of naturalists, scientists, sportsmen, and land managers for many years. Much has been written, but the literature on game, except in rare cases, deals with some particular phase or species. From this heterogeneous mass of information Mr. Leopold has extracted the essentials and combined them with the results of his own research and observations into a worth-while and interesting treatise on the subject as a whole. He has cut, spliced, and fitted all of the pieces into a very fine mosaic, which he terms "Game Management." His definition of game management as "the art of making land produce sustained annual crops of wild game for recreational use" indicates his constructive approach to the problem. Mr. Leopold's training, his broad knowledge of the subject, and his inherent love of the soil and of all natural beauty no doubt account largely for the approach.

"Management theory" is the topic discussed in the first five chapters of the book comprised by part I. These chapters deal with the history of ideas on and the mechanism of game management, properties of game populations, fluctuation and density, movements, tolerances, sex and flock habits, and game range.

The reader will be impressed by the simplicity of expression and the consummate skill with which somewhat dry historical, statistical, and scientific facts are assembled and made interesting and usable. Unlike most writers, the author does not bemoan the mistakes of the past nor dwell on the near extinction of wild life in this country; rather, he proceeds to analyze conditions and factors responsible for them. While free use is made of what scientific facts are available,

their paucity is emphasized. In demonstrating the need for scientific facts and the use to which they may be put, the book renders one of its major contributions. To the individual scientific worker will come a revelation as to just how the results of his work may be fitted into land-use plans. It seems certain that through this book game research will be given a much needed impetus and directed along more productive channels.

While part I gives the essential background of game management, part II deals with the methods by which the biological mechanism is to be controlled. These constitute the technique of game management.

Of particular importance to the work of forest officers are the four consecutive steps outlined for the initiation of game management:

1. Census—measuring the stock on hand.
2. Measuring the productivity of the stock and comparing it with a standard.
3. Diagnosis—weighing the factors and selecting one or more for control; testing these on a small scale to ascertain whether the selection is correct and the method of control effective.

4. Control of selected factors on a large scale.

The most promising methods to be followed in each of the above steps are fully discussed, and while the author recognizes their inadequacy he points out that the interests of wild life do not permit the delay incident to the development of the last word in methods. Rather, he stresses the paramount necessity of using the best tools now at hand.

Part II also deals with diagnosis of productivity, game refuges, control of hunting, predators, food and water, cover, disease, and accidents. It contains discussions of miscellaneous techniques, including artificial propagation, nesting studies, trapping game, game maps, range tallies, and game surveys.

Game economics and aesthetics, policy and administration, and game management as a profession are discussed in part III.

² Leopold, Aldo: *Game Management*, 481 pp., New York, Charles Scribner's Sons. 1933. \$5.

In his discussion of game administration the author points out that basic to an intelligent consideration of the game problem is an understanding that only the landowner can successfully propagate game. It matters not whether it is done individually or collectively, the extent to which the landowner receives some return for his interest and expense determines the extent to which he will keep his land productive. That sounds like one of those truisms or platitudes which Mr. Leopold implies are almost worthless in comparison with the new formula that all species must have the proper environment to insure productiveness. Nevertheless, it is only within the past few years that the general public has begun to accept the premise that the private landowner is entitled to some consideration. "Game Management" should be of great aid to owners of land which is suitable range for one or more species of game, and administrators of public lands, as well as those who manage lands in private ownership, will find how game production may be fitted into other land operations for which they may be responsible.

The present state of game administration is aptly described. Some States have gone through the first step of "policing the remnants of the virgin game crop" and entered the second step of "game farming." Others have taken the third, fourth, and fifth steps of "acquiring State lands and managing them", "starting educational work", and "starting fact-finding work after learning that the requisite facts for steps 2, 3, and 4 do not exist." None has undertaken the sixth step, "starting to encourage private management and regulating private management in the public interest."

On this background, emphasis is laid upon the kind of regulatory machinery and personnel needed. The author is not so greatly concerned over the form of organization; he is more concerned over personnel capable of "building their own house."

In treating game management as a profession, Mr. Leopold calls attention to what has happened in the fields of forestry and agricultural administration and sees the same transition in the field of game. The specified qualifications for the individual and the curricula recommended for schools will be most helpful to students and colleges.

Since so much thought and discussion are now being devoted to "multiple use plans" or "coordinated land-use programs", the book comes at an opportune time for forest officers. It not only provides methods of diagnosis of our game problems, but teaches us how to make better use of accumulated data.

As explained in the preface, this volume aspires to a three-fold function: First, to serve as a text for those practicing game management or studying it as a profession; second, to interpret for the thinking sportsman or nature lover the significance of some of the things that he sees while afield with gun or glass or that he does in his capacity as a voting conservationist; third, to explain to the naturalist, biologist, agricultural expert, and forester how his own science is related to game

management and how his practices condition its application to the land.

How well and faithfully the volume performs these functions can be appreciated only after it is carefully studied, page by page.

Reclaiming Gullied Lands With Soil-Binding Plants

By W. R. MATTOON, United States Forest Service

Farmers' Bulletin 1697³ brings out clearly the value of a vegetative cover in checking soil erosion and regulating stream flow by permitting rapid absorption of water from rainfall and by obstructing its quick run-off from the surface. Certain plant species have been found to be particularly adapted to soil conservation in the Southern States. These natural soil binders include black locust, shortleaf pine, and cottonwood trees; honeysuckle and kudzu vines; and Bermuda grass and Lespedeza.

The problem of checking gully erosion has a double phase in that gullies are not only destructive in and of themselves but they are normally a menace to adjacent productive land, threatening combined losses in land values often far in excess of the cost of checking and reclaiming them.

The planting of trees and other forms of vegetation for gully control may well be conducted as an independent enterprise, but usually it goes hand in hand with the building of a series of low dams in the various parts of the gully system or basin to be treated. As conducted in the silt loam uplands of the Mississippi River basin in western Tennessee and northern Mississippi, the problem of gully reclamation has three distinct steps, namely, constructing low brush dams at strategic points over the headwaters of the gully system, plowing the gully banks and top for a width of 10 to 20 feet back from the edges, and lastly planting a cover on the caught-up soil above the dams and the sides and tops of the gully banks.

The work of building dams and plowing the soil should be done several months in advance in preparation for the planting, for which the late winter and early spring are generally the most favorable times. The need for planting natural soil binders in the South is greatest on eroded and abandoned farm lands. The region in greatest need of extensive treatment covers a vast area over the lower slopes of the Appalachians and adjoining the piedmont region, extending to the coastal plain, and in the hilly uplands of the central Mississippi basin.

Recent studies by the Southern Forest Experiment Station show that it is often cheaper to plant the gullying basin than it is to construct dams or dikes. The vegetation not only holds the soil but also builds up its fertility, and the trees, especially black locusts, yield

³ Meginnis, H. G.: Using Soil-Binding Plants to Reclaim Gullies in the South, 18 pp., illus. U.S. Department of Agriculture, 1933.

a valuable crop of fence posts in 10 to 20 years. Excellent stands of blue grass are known to have become established naturally under the protective shade and in the soil enriched by roots of the leguminous black locust trees. This occurrence was observed in the silt loam soils of west Tennessee and northern Mississippi, where, in fact, the studies reported in the bulletin were almost exclusively made.

The author includes a reference to the experiments in the planting of various grasses conducted by the Mississippi Branch Experiment Station located at Holly Springs, Miss. He might very well have made similar reference to the splendid accomplishment of the Tennessee State Department of Forestry⁴ in developing the method (which might well be named the Tennessee method) of building brush dams, plowing gully banks, and planting black locust trees.

Since the studies were made almost exclusively in the deep silt loam (loess) soil found only over the very restricted area mentioned above, the title of the present bulletin would seem to be rather too broad, and likewise the findings of the study not sufficiently guarded by caution as to their application generally over the South. For example, we have yet to ascertain the applicability of the various trees and other plants to planting in the sterile, dense, clay subsoils of the vast piedmont region.

New Forest Tax Plans Proposed in Report

Progress Report No. 18 of the Forest Taxation Inquiry of the United States Forest Service⁵ is the first published installment of the conclusions reached by the Inquiry as the result of a Nation-wide study of forest taxation conducted during the past 6 years. This preliminary publication contains that part of the concluding chapter of the full report which deals with definite plans for special tax treatment of forest properties. The complete report of the study is now being prepared for publication.

The investigations of the Inquiry have made it clear that the tax disabilities suffered by forest lands are common to rural real estate in general, and to rural real estate in sparsely settled regions in particular. These disabilities go back to broad problems of land use and settlement and governmental organization and cost, and involve questions of assessment practice and other procedures required by the property tax system. But even if these broader questions were disposed of, there are inequalities in the tax burden that weigh heavily on certain kinds of forest property even under a perfectly administered property tax in a properly organized rural community. It is the methods of avoiding these inherent inequalities by specific plans of forest taxation that are presented in the present progress report.

Somewhat surprisingly, the Inquiry reports adversely upon the yield tax. This plan, whereby a tax on the yield of forest products when harvested is substituted for the annual property tax upon the value of the trees, has been generally favored and has found its way onto the statute books of a number of States, though so framed as to lead to very slight application. The Inquiry concludes that the yield tax would prove very defective in practice, since there is no way of determining a rate for such a tax that would be equitable to the forest owners and at the same time make the tax bear a proper relation to the property tax paid by other classes of the community. The disturbance of local revenues resulting from application of the yield tax would be very serious unless the plan were accompanied by drastic reorganization or redistribution of the respective functions of State and local governments. The yield tax would be unduly severe upon old-growth forests being at present operated, and it might in time come to place an unduly severe burden upon the majority of the forests.

The plan of exempting all immature timber from the property tax, as is done in California and as was recommended by a committee of the National Tax Association in 1922, is also reported upon adversely. It is shown that except under very special circumstances, which would seldom be found in practice, this plan would give an undue advantage to forest properties.

Two plans are recommended by the Inquiry. One is a device for counteracting those adverse effects of tax payments required in advance of the receipt of income which the property tax imposes upon deferred-income forests, and is called the "adjusted property tax." It would permit a deduction from the assessed value of the timber each year based upon the normal expected increase in the value of the forests. An exception to this would occur in years when the receipt of income cancels the reduction. In other respects the plan retains the form of the property tax and would give the same stability to local revenues.

The other recommended plan is "partial timber exemption." Under it a certain percentage of the value of the timber—at a uniform rate for the whole State as fixed in the law—would be exempt from taxation. This would apply to young-growth forests and, under certain circumstances or with certain limitations, to old-growth forests also. Through it a rough adjustment of the property tax to the special circumstances of forestry would be accomplished with the minimum of change from the present tax system. It is similar to a plan now in use in some of the cantons of Switzerland.

The Inquiry gives no support to a number of devices which have found more or less favor among forest-tax reformers, including fixed assessments of forest properties and a specific tax in lieu of the regular property tax, or to attempts to make forest tax laws rigid and immune from amendment by future legislation through the expedient of making the law a contract between the State and the taxpayer. No faith is placed in any plan of taxation which makes the form or amount of

⁴ Under the direct charge of former State Forester R. S. Maddox.

⁵ 60 pp., mimeographed, May 1, 1933.

tax depend upon the intention of the owner to practice forestry; the report insists that all tax laws should be of general application and compulsory, without any of the optional features which characterize many existing yield tax laws. Facts, not intentions, are declared to be the proper measure of tax obligation.

A Useful Forestry Text

By W. K. WILLIAMS, Extension Forester, Office of Cooperative Extension Work

The University of Michigan has recently issued a publication entitled "Forestry and School Studies," by E. V. Jotter, assistant professor of forest extension of the School of Forestry and Conservation. The bulletin, which carries the subtitle "A Correlation for Elementary Grades", brings together information on the subject of forestry in the form of lessons for teachers and pupils. There are 128 pages; 100 of them are given over to 40 lessons, which means that the average lesson covers $2\frac{1}{2}$ pages. There are 20 lessons under each of two main divisions: an "introductory program" for pupils in the first five grades, and an "advanced program" for pupils in the 6th to 8th grades.

In speaking of the purpose of the publication, the author says: "The bulletin aims to present some of the simpler and more important phases of the subject in such a way that teachers can pass them on to the children through the usual school subjects such as arithmetic, reading, language, drawing, geography, history, and nature study." This method, he believes, "has the advantage of avoiding the introduction of a new course into the curriculum and of correlating forestry with these studies so as to give the pupils a keener appreciation of its broad scope and interrelations."

At the beginning of each lesson is a general discussion which the author intends as a forestry background for the lesson. In correlating the forestry lesson with other studies, such as arithmetic, geography, and English, there are a number of questions and exercises which call for simple investigations or calculations, the making of a map, the reciting of a poem, or the explaining of a simple forestry operation such as the planting of a tree.

As a usable outline of this method of teaching, in which one subject is correlated with others to bring out the practical relation between them, this publication should make the study of forestry interesting to the pupil and should give him some definite ideas of what forestry is. The presentation of the subject-matter is simple, direct, and easily understood, and with proper guidance on the part of the teacher, should open doors to new fields of thought.

Three sections at the end of the book contain "Notes on Forestry Publications"; an appendix which includes

a plan for improving rural school grounds and the Michigan municipal forest act; and an index.

Some Articles of Interest in Forestry Periodicals

Allgemeine Forst- und Jagd-Zeitung, October 1932.—Die praktische bedeutung der pflanzensoziologie für die forstwirtschaft insbesondere waldbau und bodenkunde, by F. K. Hartmann, pp. 317-329. November 1932.—Die kalkulation des wirtschaftserfolges und der wirtschaftlichkeit nach der bodenreinertrags-theorie, by H. Lemmel, pp. 353-360; Das verfahren der messung der wirtschaftlichen leistungsfähigkeit des waldes in seiner praktischen anwendung auf ein hessisches privatforstrevier, by W. Pforn, pp. 361-373.

Forstwissenschaftliches Centralblatt, October 15 and November 1, 1932.—Die vereinfachung der bestandsberechnung, by W. Hahenadl, pp. 681-693 and 734-745.

Indian Forester, January 1933.—European silvicultural research. Part IV. Mixtures, by H. G. Champion, pp. 22-28.

Journal of Forestry, November 1932.—Change in the form of red spruce after logging and of northern white pine after thinning, by C. Edward Behre, pp. 805-810; Forest cover in relation to upland game bird management, by Gardiner Bump, pp. 834-837; Recent progress of the Norwegian agricultural and forestry credit society: significance for American farm forestry, by Bernard Frank, pp. 856-859. December 1932.—European game management as suggestive of American procedure, by Edward C. M. Richards, pp. 948-950; A method for determining the economic value of a forest road, by J. P. Martin and T. W. Norcross, pp. 988-1003; Forest lands as investments for insurance companies, by P. A. Herbert, pp. 1004-1007. January 1933.—The portable band sawmill and selective logging in second-growth loblolly pine, by R. D. Garver, pp. 68-75; History and present status of forest fire insurance in Japan, by M. Yatagai, pp. 79-84.

Revue des Eaux et Forêts, October 1932.—La nouvelle méthode d'éclaircie appliquée dans la forêt domaniale de Bellême (Orne), by Leon Pardé, pp. 841-844.



The third edition of the Forestry Almanac, published by the American Tree Association, Washington, D.C., contains 484 pages, 94 pages more than the second edition, issued in 1929. Information covering the whole field of forestry is given in the almanac in such a way that almost any desired fact may be easily found. The price is \$2.